Neutron and synchrotron radiation non-destructive methods for the characterisation of materials for different industrial applications

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Abstract

Neutron and synchrotron radiation techniques are very powerful non-destructive methods for the characterisation of a wide variety of materials.

In particular, neutron and synchrotron radiation diffraction is nowadays widely used for the evaluation of residual stresses induced by thermal and mechanical treatments in materials and components for industrial applications.

By Small-Angle Neutron Scattering (SANS), microstructural features induced by termomechanical treatments, such as precipitation and cavitation, can be investigated from a quantitative point of view (determination of size distributions, volume fraction and so on).

Several applications of these two techniques will be presented with particular reference to the aeronautical and automotive industries.